

Amendments to the Claims

1. (currently amended) A bonding apparatus for a wire bonding machine comprising:

a bonding tool coupled to an ~~An~~ ultrasonic transducer driver , said transducer
comprising:

a giant magnetostrictive element,
a fastener for holding the giant magnetostrictive element under mechanical pressure,
a first field generator for providing a magnetic bias field,
a second field generator for providing a magnetic drive field, and
a magnetic circuit for channelling the magnetic fields in the giant magnetostrictive element.

2. (currently amended) The apparatus ~~driver~~ of claim 1 wherein the giant magnetostrictive element is a rare-earth-alloy-based material.

3. (currently amended) The apparatus ~~driver~~ of claim 1 wherein the giant magnetostrictive element is Terfenol-D and its composites.

4. (currently amended) The apparatus ~~driver~~ of claim 1 wherein the giant magnetostrictive element is cylindrical with a central hole.

5. (currently amended) The apparatus ~~driver~~ of claim 1 wherein the giant magnetostrictive element is a composite comprising two or more rare-earth-based alloy parts separated from one another by a layer of passive polymeric material.

7. (currently amended) The apparatus driver of claim 1 wherein the first field generator is a permanent magnet.
8. (currently amended) The apparatus driver of claim 1 wherein the second field generator is an electric coil.
9. (currently amended) The apparatus driver of claim 1 wherein the magnetic circuit ~~is a magnetic enclosing circuit having~~ comprises a pair of magnetic return-path rings and a magnetic return-path cylinder ~~made of~~ having high-permeability, high-resistivity and high-saturation material.
10. (currently amended) ~~An ultrasonic transducer for a~~ A bonding apparatus ~~for a wire bonding machine the transducer~~ comprising:
a horn having a bonding tool at a smaller end and a mounting collar at an opposite end, and
an ultrasonic transducer a driver coupled to the horn, ~~the driver and~~ and comprising a giant magnetostrictive element, a fastener for holding the giant magnetostrictive element under mechanical pressure, a first field generator for providing a magnetic bias field, a second field generator for providing a magnetic drive field, and a magnetic circuit for channelling the magnetic fields in the giant magnetostrictive element.
11. (currently amended) The apparatus driver of claim 10 wherein the giant magnetostrictive element is a rare-earth-alloy-based material.
12. (currently amended) The apparatus driver of claim 10 wherein the giant magnetostrictive element is Terfenol-D and its composites.

13. (currently amended) The apparatus driver of claim 10 wherein the giant magnetostrictive element is cylindrical with a central hole.

14. (currently amended) The apparatus driver of claim 10 wherein the giant magnetostrictive element is a composite comprising two or more rare-earth-based alloy parts separated from one another by a layer of passive polymeric material.

15. (currently amended) The apparatus driver of claim 10 wherein the fastener is a threaded shaft and a nut made of nonmagnetic metallic material.

16. (currently amended) The apparatus driver of claim 10 wherein the first field generator is a permanent magnet.

17. (currently amended) The apparatus driver of claim 10 wherein the second field generator is an electric coil.

18. (currently amended) The apparatus driver of claim 10 wherein the magnetic circuit ~~is a magnetic enclosing circuit having~~ comprises a pair of magnetic return-path rings and a magnetic return-path cylinder ~~made of~~ having high-permeability, high-resistivity and high-saturation ~~material~~.